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Reliable Protection for ECUs



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When attackers gain unauthorized access to increasingly connected vehicle electrical systems, the situation can turn extremely dangerous for occupants. Holistic strategies are required to reliably protect vehicular systems across their entire service life against hackers, viruses, and unauthorized software uploads while maintaining the functional safety of the vehicle in a worst-case scenario. Hardware security modules (HSMs) are an integral component of such holistic

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automotive HSMs and shared them with semiconductor manufacturers. Since that time, various manufacturers' derivatives of the Bosch HSM have surged onto the market. ESCRYPt's CycurHSM firmware enables using the full functionality of an HSM. It protects vehicle systems against unauthorized access in every operating phase – which means during booting, regular operation, and installation of software updates or upgrades. To achieve this, the hardware and software work hand in hand. Among other features, HSMs are equipped with a true random number generator (TRNG), in addition to accelerator hardware that enables lightning-fast calculation of AES-standard cryptographic message authentication codes (MACs) on the modules. This hardware provides the basis for the three central functions of CycurHSM:

- Secure boot
- Secure flashing
- Runtime manipulation detection

"CycurHSM is a standardized software stack for the Bosch HSM as well as all key derivatives on the market," says Dr. Frederic Stumpf, product manager in charge at ECRYPT. It supports HSMs from Infineon, Renesas, Freescale, and STMicroelectronics platforms. The software relies on the established ETAS RTA-OS real-time operating system for easy integration. And thanks to an additional interface, an AUTOSAR environment is not an absolute requirement for using CycurHSM. Because of this flexibility, as well as its high degree of functionality, this firmware will promote the rapid take-up of HSM technology in the marketplace.

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